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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/070,228
Filing Date: October 03, 2002
Appellant(s): LAWS ET AL.

Jeffrey A. Pyle
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed September 21, 2005 appealing from the Office action mailed June 17, 2005.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

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(8) Evidence Relied Upon

No evidence is relied upon by the examiner in the rejection of the claims under appeal.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over any one of the PCT application to Bouyoucus ('452) or US patents to Barber et al ('404), Yang ('176) when taken in view of Sallas ('668) and Barr ('306).

Claims 1 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ray ('061) or Manin ('754) when taken in view of Sallas ('668) and Barr ('306).

Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huizer ('956) when taken in view of Sallas ('668) and Barr ('306).

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the UK application to Lugg ('503A) when taken in view of Sallas ('668) and Barr ('306).

Claims 1-8 and 19-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haugland et al ('180) when taken in view of Barr ('306) and Sallas ('668).

Per claims 1, 2, 3, 6, 7, and 8 see Bouyoucus, figures 8, 11 and 22.

Per claims 4 and 5, see Bouyoucus, col. 6, lines 42-51.

Similarly, with respect to Haugland et al, see col. 3, line 58 – col. 4, line 14 and col. 5, line 54 – col. 6, line 11.

With respect to Barber et al, see col. 3, line 62 – col. 4, line 21, col. 4, line 61 – col. 5, line 48, and col. 8, lines 2-10.

With respect to Lugg, see col. 1, lines 9-23 and 49-64, and col. 2, lines 66-89, 118-123.

With respect to Yang, see Figs. 1 and 2, col. 2, lines 22-51, and col. 4, lines 10-24.

With respect to the rejections of the above claims over the patents to Manin, Ray and Huizer, applicant is referred to the PCT search report and International Preliminary Examination report.

The difference between the above noted prior art and independent claims 1, 6 and 25 is the claims specify use of "marine vibrators" and emit the seismic energy "during a sweep" and the above noted references disclose use of air guns, water guns

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and sparkers. Thus, the difference between the instant claims and the references noted above lies in the type of marine seismic sources used.

Barr (col. 1, lines 39-48) and Sallas (col. 1, lines 20-38) each discloses that in marine seismic surveying air guns (impulse sources) and marine vibrators (sweep sources) are commonly used types of energy sources. Marine vibrators, with their concomitant sweep technology, tend to produce pressure pulses that have a broad band frequency spectra and air guns tend to produce pressure pulses with a narrow band frequency spectra. Sallas teaches that although air guns are very popular as seismic energy sources, environmentalists prefer marine vibrators over air guns because air guns are harmful to marine life.

Therefore, in view of the well known use of air guns and marine vibrators as seismic energy sources in the marine environment, and the preference for marine vibrators over air guns, especially to environmentalists, it would be obvious to one of ordinary skill in the art to substitute a marine vibrator for the air guns of Bouyousus et al, barber et al, Yang, Lugg, Manin, Ray, Huizer or Haugland et al.

It is noted that claims 26-28 claim the functional relationship between vibrator depth and wavelengths of the emitted energy. Haugland et al teaches (col. 5, line 54+) the relationship between emitted frequency and vibrator depths is controllable. In as much as the frequency is an inverse wavelength relationship, it is obvious to one of ordinary skill in the art that the claimed relationship between wavelength and vibrator depths is (a) known to one of ordinary skill in the art as shown by Haugland et al's

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frequency/depth relationship and (b) of a design choice (claims 27, 28) that one of ordinary skill in the art would find obvious.

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bouyoucus, Haugland et al, Yang or Barber et al as applied to claims 1, 6, 8, 19 and 23 above, and further in view of Lugg et al ('503A).

Claims 9 and 10 further differ over the above noted patents by claiming specific depths and arrangements for the marine vibrators.

However, the specific spacing depths and arrangements are of a design choice that one of ordinary skill in this art would find obvious since applicant has not disclosed that the specific depths and arrangement of vibrators claimed provides an advantage or solves a stated problem. Lugg, for instance, on page 2, lines 18-22, teaches that the specific depths chosen were through a computer synthesis of combinations of time signals and computed Fourier transforms to achieve the most satisfactory waveform. Thus, although the prior art does not specifically disclose the depths and arrangements of vibrators claimed, the prior art knows that such factors as depths and the combinations and arrangements of vibrators are factors that affect the waveform output of the arrays. The depths and arrangements are, therefore, known to be a result dependent variable. Skill is presumed to be possessed by the artisan. Determining the optimum values of result effective variables (depths and combinations of vibrators) would have been obvious and ordinarily within the skill of the artisan.

Allowable Subject Matter

Claim 30 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(10) Response to Argument

Appellants first argue that the difference between impulse sources (i.e., prior art air guns) and sweep sources (instant claims) is significant and further argues what is not disclosed by the prior art patents. This argument is not convincing since although there may be a difference, however "significant", between an impulse source and a sweep source, the rejections are not based upon the level of difference between the two types of sources. The rejections are based, rather, upon what the Sallas and Barr references teach and whether one of ordinary skill in the art would find such teachings advantageous to apply to the primary prior art patents. It is the opinion of the examiner that such is the case.

Appellants then argue that one of ordinary skill in the art would not attempt to mitigate notch frequencies arising from ghost reflections of a sweep signal by looking to a reference teaching a technique for shaping an impulse signal. This argument fails first since none of said language is being claimed and second, fails to take into account that the reason for applying Barr or Sallas to the primary patents lies in the teachings of Barr and Sallas which disclose that sweep sources provide for a much environmentally friendly seismic energy source over impulse sources. Thus, as opposed to appellants

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argument, it is for a reason other than argued (shaping of impulse source) that the examiner finds one of ordinary skill would look to substitute a sweep source for an impulse source. Further, the fact that applicant has recognized another advantage (ameliorating of ghost signals) which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious.

In response to appellant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, one of ordinary skill in the art would clearly find it obvious to combine the references in the manner set forth in the above rejection since the Sallas reference specifically teaches the preference for sweep sources over impulse sources to environmentalists.

In response to appellant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. Specifically, appellant, on pages 10-15 argues the specific primary references to Bouyoucus, Barber et al, Yang, Ray, ManinHuizer, Lugg and Haugland et al in view of the secondary references to Sallas and Barr. In every case the argument is

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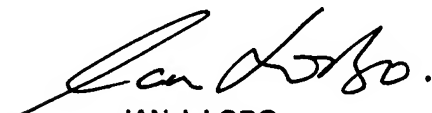
that improper hindsight is used to justify the combination. This is not convincing because the rejections takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure. The Sallas and Barr references provide a reason and advantage (more environmentally friendly) for substituting a sweep source for an impulse source.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,


IAN J. LOBO
PRIMARY EXAMINER

Conferees:

ijl

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